

Minnesota Wetland Conservation Act



Discussion of Issues Related to the March 15, 2016
Report to the Legislature

February 24, 2016

Agenda

1. Welcome and introductions.
2. Meeting purpose/ground rules.
3. In-Lieu Fee Wetland Replacement.
4. Wetland Replacement Siting (including High Priority Area implementation).
5. Northeast Actions Eligible for Credit.
6. Discussion.

Purpose of Meeting

To discuss issues related to the March 2016 report.

- 1) Present information and ideas.
- 2) Obtain constructive feedback and alternative ideas.

Purpose of Meeting

➤ The purpose of the meeting is **NOT** to:

- X Re-hash or argue about statute changes or the rationale for them.
- X Present rule language or final proposals.
- X Discuss issues unrelated to the March report.

Note: Some background and understanding of previous discussions will be helpful.

Ground Rules

Please hold comments until time for discussion.

- ✓ Quick clarifying questions OK if time permits.
- ✓ Raise your hand.
- ✓ We may cut off questions/discussion to stay on track.
- ✓ You can provide comments in writing and/or there will be further opportunities to participate/comment.

❖ Respect differing opinions - all perspectives are legitimate. In the end, the WCA policy goal is to improve outcomes for the public as a whole.

5

Outline

- More detail on ILF and its CPF
- Mitigation objectives
- Tools to achieve objectives
- Matching tools with objectives

Remember: purpose of ILF is improved mitigation targeting and outcomes.

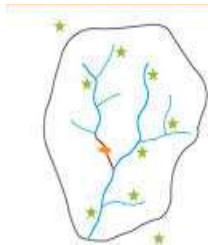


3/23/2016 6

What is a Compensation Planning Framework (CPF)?

The targeting plan for mitigation using a watershed approach.

Non - Targeted



Targeted



3/23/2016 7

What is required for a CPF?

Analysis and/or description of:

- Threats to (aquatic) resources (in the service area)
- Historic losses
- Current conditions
- Resource goals
- Prioritization strategy
- Long term protection, mgmt., reporting, monitoring, etc.



3/23/2016 8

How do these factors influence targeting?

Each watershed has its own current stressors, its own potential future threats and its own set of unique characteristics.

So.....

A mitigation action that is valuable in one watershed may not be sustainable and/or valuable in another watershed.



3/23/2016 9

Developing a CPF

Not only do we need to identify current and potential stressors in a watershed, we also need to:

- Decide what scale of watershed to consider, and
- what functional goals are important and practicable to achieve.



3/23/2016 10

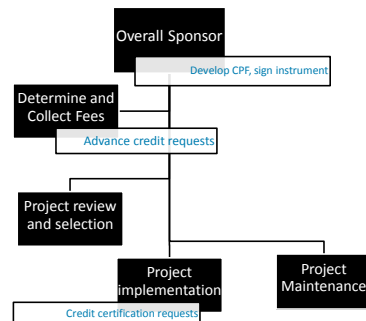
Developing a CPF

CPF for MN will likely be developed at several scales.



3/23/2016 11

ILF Components



3/23/2016 12

ILF Roles & Responsibilities

| ILF Component | Responsibility |
|---------------------------------|------------------------------|
| Develop CPF and Instrument | BWSR working with contractor |
| Determine, collect, manage fees | BWSR or contractor |
| Advance credit requests | BWSR |
| Project selection and review | BWSR |
| Land/Easement Acquisition | BWSR &/or contractors |
| Project Design | BWSR &/or contractors |
| Project Implementation | BWSR &/or contractors |
| Long term management | BWSR &/or contractors |

Contractor refers to nonprofit, private consultant, private banker

3/23/2016

ILF Sponsor - BWSR

Why BWSR?

- Member of IRT, cooperative efforts with Corps.
- LGU network for finding and selecting projects.
- More experience restoring wetlands in MN (maybe the country) than anyone else (over 250,000 acres since 1987).
- Easement acquisition process in place.
- Cooperative projects with Road Program.

3/23/2016 14

Also, a working understanding of the regulatory process is necessary

Conservation Programs

Can be flexible to attract more landowners.

Program approval only needed

Decisions based on overall program goals

Consequences if fail to meet goals?

Regulatory Program

Must adhere to regulatory rules and requirements

Multiple agency approvals needed

Decisions based on credit yield & CPF

Failure has legal consequences

ILF Sponsor - BWSR

Why BWSR?

- More opportunity to partner with LGUs, state agencies and conservation organizations to complete projects on lands with a variety of ownership (private, local, state and federal lands).

3/23/2016 16

Hypothetical Example



3/23/2016 17

ILF Sponsor - BWSR

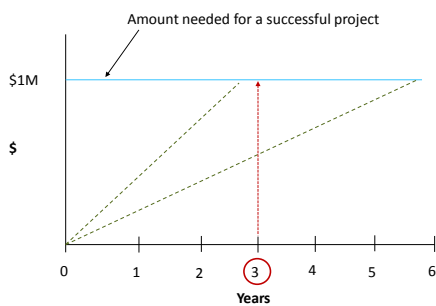
Why BWSR?

- Ability for statewide implementation (multiple service areas, cross service areas).
- Startup funds to reduce program default risk.



3/23/2016 18

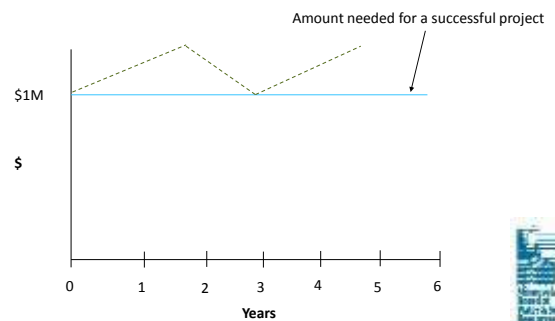
Without Start-up Funding



3/23/2016 19



With Start-up Funding



3/23/2016 20



How will the ILF operate without adversely affecting private banking?



3/23/2016 21

ILF & Private Banking

Establish a preference for bank credits over ILF in rule.



3/23/2016 22

ILF & Private Banking

- Prioritize difficult to replace wetland functions (white cedar, floodplains, new NE credit actions, etc.).
- Focus on larger projects not typically pursued by private bankers.
- Partner with LGUs, conservation programs/entities and even private bankers.



3/23/2016 23

Examples of Partnering from the Road Program

Contracts with 4 private bankers/landowners to produce credits for the Road Program at an agreed-upon price per credit in 2013.

Currently pursuing two projects that involve a 4-way partnership with the County, watershed district, landowner and BWSR Road Program to produce credits.



3/23/2016 24

ILF & Private Banking

- The ILF would provide another mitigation option (*if preferred bank credits are not available*) to help keep replacement of wetland functions in the watershed of impact if private bank credits are not available.
- Our intent is to have the Compensation Planning Framework developed for the ILF be used for private banking as well.



3/23/2016 25

Mitigation Objectives and Tools



3/23/2016 26

The ILF is one tool to achieve these overall mitigation objectives:

1. Keep as much mitigation in the watershed of impact as practicable.
2. Prioritize mitigation in areas where it is most effective at restoring and protecting important watershed functions (targeting).
3. Use functional surrogates to maximize replacement of important lost functions in watersheds (when not using a planning framework/watershed approach).
4. When mitigation leaves the watershed, prioritize where it goes based on statewide priorities (i.e. HPAs).
5. Encourage mitigation projects that meet local watershed needs and objectives.



3/23/2016 27

Tools we can use:



3/23/2016 28

Matching Tools and Objectives

1. **Keep as much mitigation in the watershed of impact as practicable.**
 - ILF as another option in the watershed.
 - New NE actions as an option in NE watersheds.
 - Higher replacement ratios for going out of service area.



3/23/2016 29

Tools and Objectives

2. **Prioritize mitigation in areas where it is most effective at restoring and protecting important watershed functions (targeting).**
 - Compensation Planning Framework of ILF.
 - Local high priority areas.
 - Use in-kind definition to incent priority projects.



3/23/2016 30

Tools and Objectives

3. **Use functional surrogates to maximize replacement of important lost functions in watersheds.** (when not using a watershed approach)
 - In-kind replacement definition to better match functional loss and replacement.
 - Service area boundaries



3/23/2016 31

Tools and Objectives

4. **When mitigation leaves the watershed, prioritize where it goes based on statewide priorities.**
 - Higher replacement ratios for lower priority areas.
 - Designation of High Priority Areas (HPA).
 - ILF and its compensation planning framework.



3/23/2016 32

Tools and Objectives

5. Encourage mitigation projects that meet local needs and objectives.

- Designation of local priority areas through local planning processes.
- ILF compensation planning framework.



3/23/2016 33

Summary

- The ILF is a tool that we can use to help meet many of our mitigation objectives.
- However, other tools (replacement ratios, service areas, HPAs, etc.) are equally as important for meeting mitigation objectives.
- The details will be proposed and laid out as we seek input from stakeholders and consult with Corps and other regulatory agencies throughout the rulemaking process.



3/23/2016 34

Wetland Replacement Siting

Goal: Improve the targeting and outcomes of mitigation.

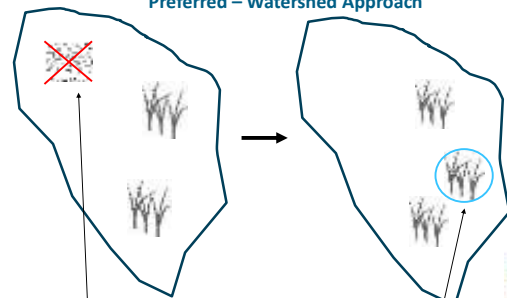
What We Will Cover:

- Current Situation
- Challenges
- Options



3/23/2016 35

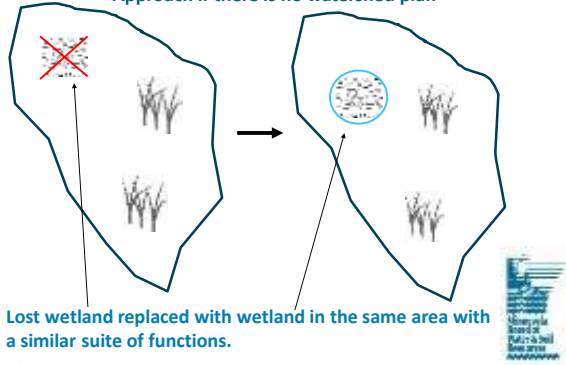
Preferred – Watershed Approach



Lost wetland replaced with wetland that has been identified in a watershed plan as a restoration priority. (regardless of type and location)



Approach if there is no watershed plan



3/23/2016 37

Wetland Replacement Siting and Ratios

In the absence of a planning framework utilizing a watershed approach we use:

1. Siting criteria (Where)
2. Replacement ratios (How Much)
3. In-kind definition (What Functions)

To direct wetland replacement.

3/23/2016 38

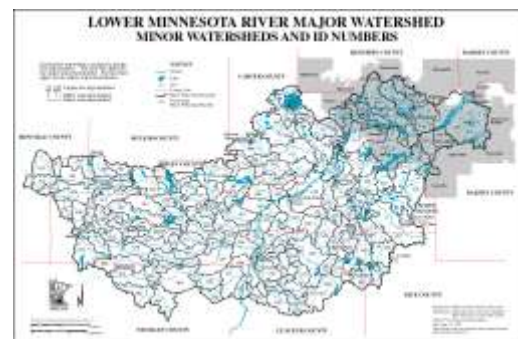
Current Situation

To figure out where you can replace wetland impacts and how much replacement you need, you need to know:

1. minor watershed?
2. major watershed?
3. bank service area?
4. <50%, 50-80%, or >80% county?
5. bank credits or project specific?
6. out-of-kind or in-kind?

3/23/2016 39

Minor Watersheds (~5600 in MN)



3/23/2016 40

81 Major Watersheds



3/23/2016 41



10 Bank Service Areas



3/23/2016 42



Pre-Settlement Wetland Areas (PSA)



3/23/2016 43



Existing Siting Criteria

Priority Siting Criteria for Replacement:

1. Onsite or minor watershed
2. Major watershed
3. Same Bank Service Area or County
4. Another Bank Service Area

Cannot:

Impact wetland in <50 County and replace in 50-80 or >80 County.

Impact wetland in 50-80 County and replace in >80.

3/23/2016 44



Current Rule for >80 Counties and Ag Impacts

| Location of Replacement | Type of Replacement | Replacement Ratio |
|---------------------------|-------------------------------|-------------------|
| Same BSA | Banking | 1:1 |
| Different BSA | Banking | 1.5:1 |
| Same major watershed* | Project-specific, in-kind | 1:1 |
| Same major watershed | Project-specific, out of kind | 1.5:1 |
| Different major watershed | Project-specific | 1.5:1 |

* For mining projects, the entirety of BSA 1 and 2 is considered the "same major watershed".

3/23/2016 45

Current rule for <80 counties

| Location of Replacement | Type of Replacement | Replacement Ratio |
|---------------------------|-------------------------------|-------------------|
| Same BSA | Banking | 2:1 |
| Different BSA | Banking | 2.5:1 |
| Same major watershed | Project-specific, in-kind | 2:1 |
| Same major watershed | Project-specific, out of kind | 2.5:1 |
| Different major watershed | Project-specific | 2.5:1 |

3/23/2016 46

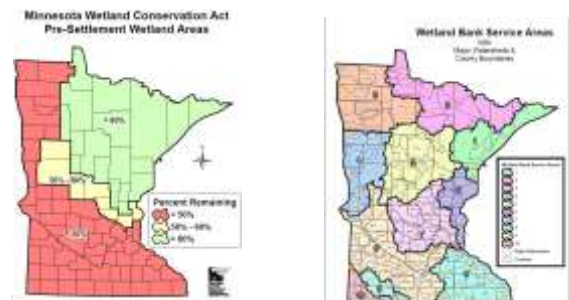
Summary of Existing Siting Rules

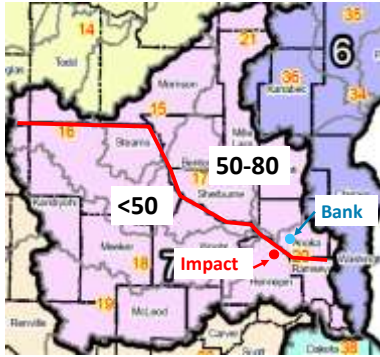
- Replacement ratio does not increase until you leave the bank service area (bank credits) or the major watershed (project-specific) of impact. *(except mining impacts in BSA 1 and 2)*
- If you justify going out of BSA, you can go anywhere, ratio is the same regardless.
- In-kind is irrelevant if using bank credits.
- In-kind is determined by plant community, not function.

3/23/2016 47

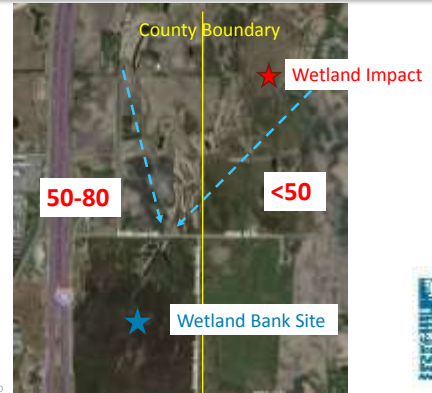
Challenges

BSAs follow watershed boundaries, pre-settlement areas (>80, 50-80, <50) follow county boundaries.

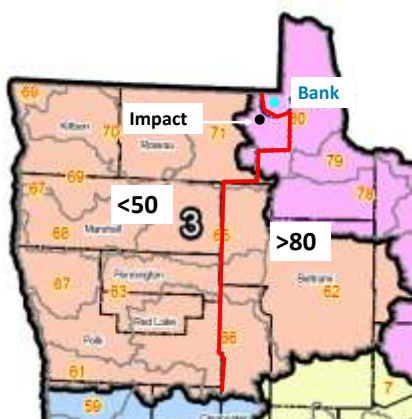




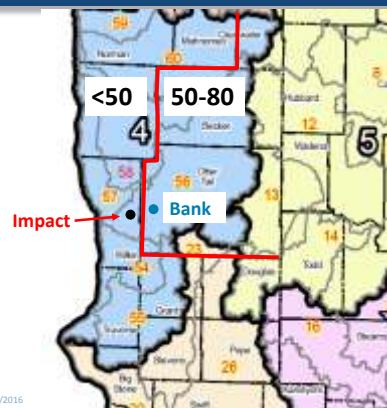
3/23/2016 49



3/23/2016 50



3/23/2016 51



3/23/2016 52

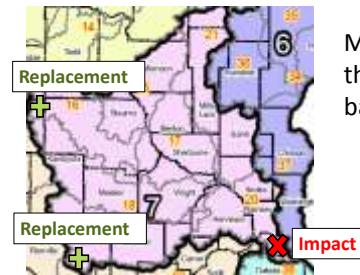
Challenges

Ecological Zones don't follow watershed boundaries or pre-settlement areas.



3/23/2016 53

Challenges

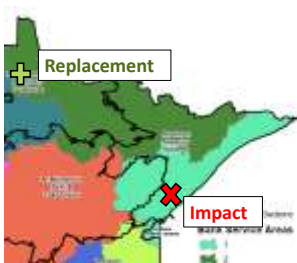


3/23/2016 54

Mitigation migrates to the cheapest land in bank service area.



Challenges



Mitigation migrates to the cheapest land when it leaves the BSA.

In this example, mitigation crosses watershed and ecological section boundaries.



Challenges with current in-kind definition

- Not applicable to banking.
- Plant communities change over time.
- Plant community is poor indicator of function.

For example, a wet meadow in the floodplain functions differently than a wet meadow in the prairie pot hole region.



Challenges

Current siting criteria do not allow incentives to utilize a watershed approach for replacement siting.

Incentives for replacement siting focus on proximity to impact and plant community type, not function.

Land values are the primary driver for replacement siting, not functional gain or goal-oriented watershed improvements.

Mining impacts in BSA 1 and 2 are considered to be in the same major watershed.



3/23/2016 57

Questions to Answer in Rulemaking

1. What is *close* when it comes to providing mitigation in relation to an impact?
2. What functional surrogate should be used to better match functional loss to gain (i.e. how to define *in-kind*)?
3. At what point are functional benefits to the watershed just as important as closeness?



3/23/2016 58

Questions to Answer

4. What size and shape should our service areas be?
5. How can we build in incentives to site replacement in conformance with local and statewide priorities (based on a watershed approach)?



3/23/2016 59

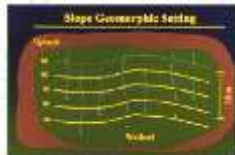
1. What is close when it comes to providing mitigation in relation to an impact?

- **Minor** watersheds (too many)
- **Major** watersheds (too many?)
- **BSAs** (pre-settlement area issue, not entirely watershed-based, does not take into account ecological aspects, relatively large)
- **Ecological sections** (not entirely watershed based)
- Some combination?
- How do HPAs fit in?



2. What functional surrogate should be used to better match functional loss to gain (i.e. how to define in-kind)?

- Currently no surrogate except for project-specific.
- Plant community is poor indicator of function.
- Current science points to landscape position and hydrology sources as the best indicator of wetland functions (HGM approach).



3/2

3. At what point is in-kind just as important as closeness?

- Are replacement ratios lower when replacement is in-kind compared to out-of-kind?
- If so, can in-kind be used to encourage needed wetland types in certain watersheds and/or high priority areas?



3/23/2016 62

4. What size and shape should our service areas be?

- Service areas can be based in part on ecology, physiography and other geographic-based features.
- Economic viability can be a consideration in designating service areas.



3/23/2016 63

Initial BWSR thoughts related to the issues discussed



3/23/2016 64

Thoughts/recommendations

Preference order: banking, ILF, project-specific.
Treat project-specific and banking the same.

- Same application procedures
- Require conservation easement
- Same fees as banking
- Same performance criteria
- Same evaluation/crediting process
- Only difference is financial assurance.



3/23/2016 65

Some initial thoughts/recommendations

- Look at changing service area boundaries to include ecological aspects.
- Redefine “in-kind” using HGM approach.
- Lower replacement ratios for in-kind or in service area as compared to out-of-kind or out of service area.



3/23/2016 66

Some initial thoughts/recommendations

- Provide incentive to go to HPA with replacement ratios.
- Allow replacement in defined service areas regardless of county pre-settlement zone designation, but adhere to the concept of not allowing impacts in wetland poor areas of the state to be replaced in wetland rich areas of the state.



3/23/2016 67

The statutes direct us to use ratios for targeting

- Target HPAs
- Target priority site/projects in service areas via watershed plan (watershed approach, CPF)



3/23/2016 68

Might look something like this:

| Replacement Siting | Ratio (A=lowest) |
|--|---------------------|
| Same service area, priority project/credits per an approved watershed plan | A |
| Same service area, in-kind | A |
| Same service area, out-of-kind | B |
| Different service area, HPA, priority project/credits per an approved watershed plan | B |
| Different service area, HPA | C |
| Different service area | D, E, F |

Or this:

| Replacement Siting | Ratio (A=lowest) |
|--|---------------------|
| Same service area, priority project/credits per an approved watershed plan | A |
| Same service area, in-kind | B |
| Same service area, out-of-kind | C |
| Different service area, HPA, priority project/credits per an approved watershed plan | D |
| Different service area, HPA | D |
| Different service area | E, F, G |

Siting of Wetland Mitigation in NE MN

Recommendation to Implement HPAs

Replacement Wetland Siting Criteria:

- 1) On-site or in the same minor watershed as the impact.
- 2) In the same major watershed as the impact.
- 3) In the same bank service area as the impact.
- 4) In another bank service area.

❖ In an area of the state that has been designated as high priority for wetland restoration.*

*Adding a new step to the siting criteria (in statute) was discussed, but was not included in the final 2015 language.

71

Other Thoughts/Recommendations

- Fees for long-term maintenance.
- New mitigation application procedures to match up with Federal requirements.

3/23/2016 72

Northeast Minnesota Alternative Actions Eligible for Credit



Stream Restoration



Riparian Preservation

Other Opportunities for Aquatic Resource Functional Gains

Siting of Wetland Mitigation in NE MN: *Issues, Recommendations and Alternatives (2014)*

*The report recognized that these actions may not yield a **net gain** in wetland acres, but **will provide** alternatives that **target specific aquatic resource functions to the benefit of the watershed.***

Impact Site
(Wetland Fill)

Alt. Mitigation Action
(Stream Rest./Protection.)



74

Statute Changes

2015 Statute Revisions

- in a greater than 80% area, **restoration and protection of streams and riparian buffers** that are important to the functions and sustainability of aquatic resources.
- In greater than 80% areas preservation of wetlands, **riparian buffers, and watershed areas** essential to maintaining important functions and sustainability of aquatic resources in the watershed that are protected by a permanent conservation easement....

75

Prior Stakeholder Discussion

• Stream Restoration

- Source/Effects of Degradation
- Problem/Cause/Fix
- Meander Belt Concept



• Buffer Restoration

- Source/Effects of Degradation
- Goals
- Set width or adaptive strategy
- Crediting options

Stream Restoration Examples



Stream Restoration Example

The Details:

- *Multi-agency project in Beltrami County*
- *Mud River Dam Removal and Channel Restoration Project*
- *Major Issue: Sediment accumulation behind dam*



Source: Minn. DNR

Mud River Dam Removal and Channel Restoration Project

- **Dam** was built in 1917
- **Original purpose** – provide source water for walleye hatchery
- **Problem** – sedimentation
- **Reason for removal of dam:** Sediment accumulation caused temperature and water quality problems for raising walleye fingerlings
- **Project Costs:** Engineering - \$35,000, plus \$40,644 for Construction
- **Project Partners:** Red Lake DNR, MNDNR, MnDOT, EPA, NRCS

Source: Minn. DNR



Mud River Dam Removal and Channel Restoration Project

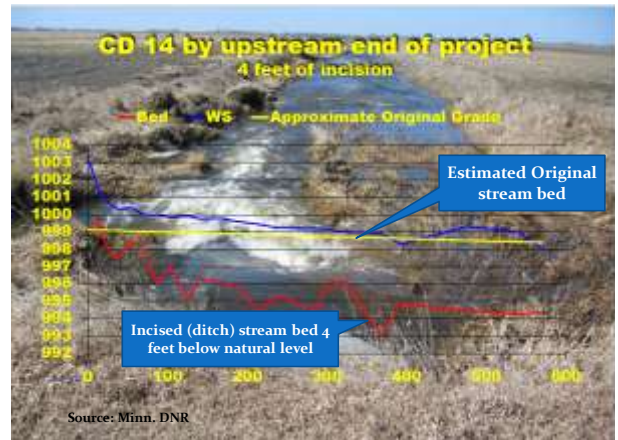
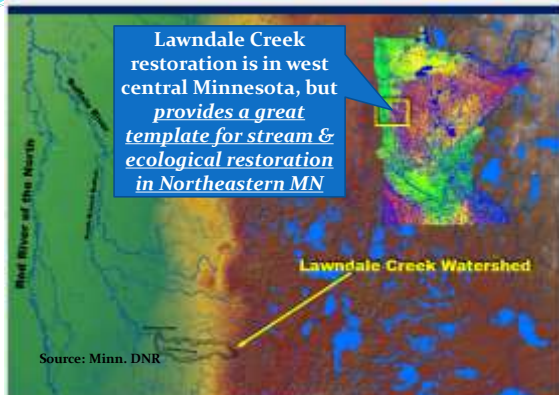
Ecological Benefits:

- Reconnected Mud River to Lower Red lake
- Provides stream habitat, fish passage and spawning habitat
- Improved safety
- Improved water quality.



Source: Minn. DNR

Example Stream Restoration Project - DNR



Ditched Lawndale Creek

Poor Habitat

Ditches had very poor aquatic habitat, no pools, low biodiversity, and very few gametfish.

Erosion and Sedimentation

Ditches were eroding and filling downstream wetlands and channel with sediment.

Poor Water Quality

Lawndale Creek and Downstream Buffalo River are turbidity impaired.

Altered Hydrology

Ditches drained historic wetlands, lowered water table, and increased downstream flooding.

Source: Minn. DNR



Road Crossings – May impede Natural Hydrology with Significant Impacts

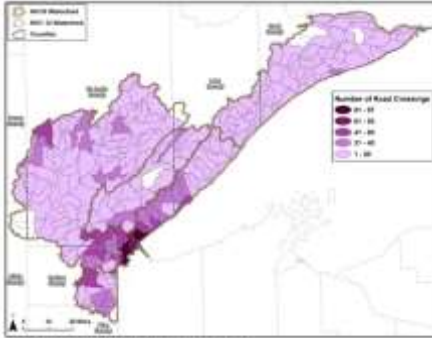
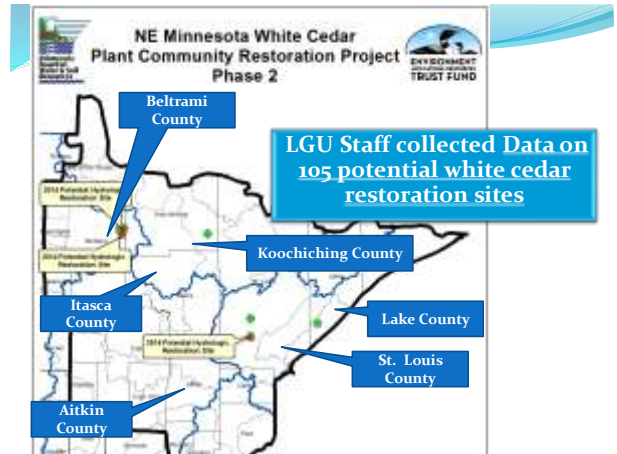
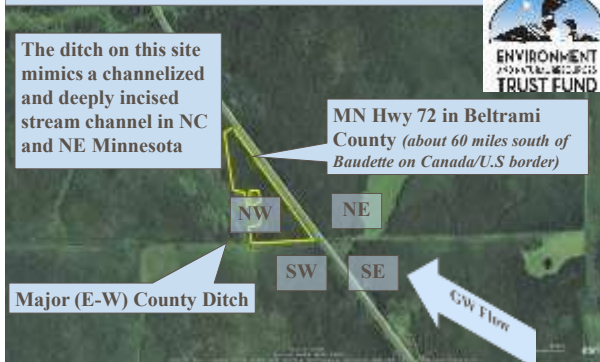


Figure 14. Watershed court – modify road crossings



NE Minnesota White Cedar Restoration Project “Goldilocks Site”



Stream Restoration Crediting

- Cannot directly measure functional lift (lack of precise tools/methods).
- Need to use surrogates of function.
- For other credit actions, surrogates are area-based.

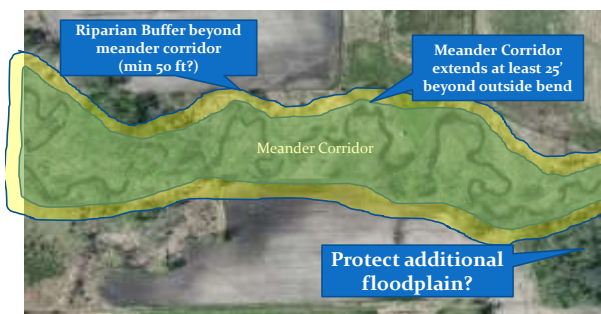
Stream Restoration Crediting

Important zones that were identified for streams are:

- Meander corridor
- Floodplain
- Riparian buffer

These areas can reasonably be identified on most streams.

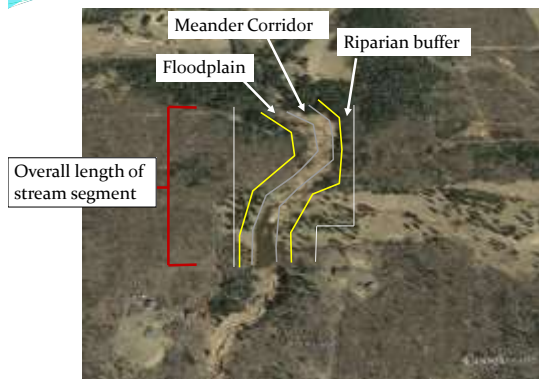
Example – Meander Corridor & Buffer



Stream Restoration Crediting

- Restoration activities in the meander corridor will have the most direct/immediate impact on functions (sediment removal, dam removal, re-meandering, etc.)
- Restoration actions in the floodplain will in general have a less direct/immediate impact on functions (reconnecting floodplain to channel, removing sediment, etc.)
- Restoration actions outside the floodplain will primarily serve as riparian buffer to protect the channel and floodplain from sources of degradation.

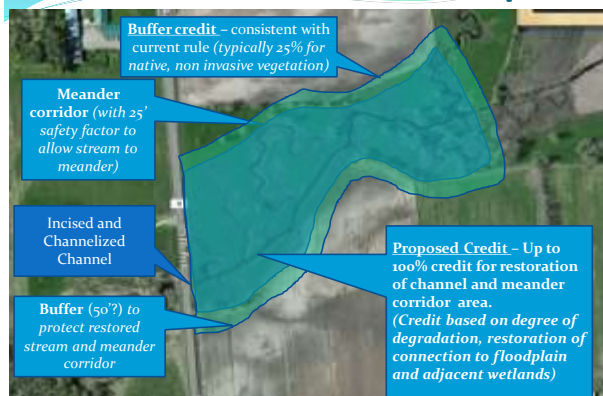
Stream Restoration Crediting



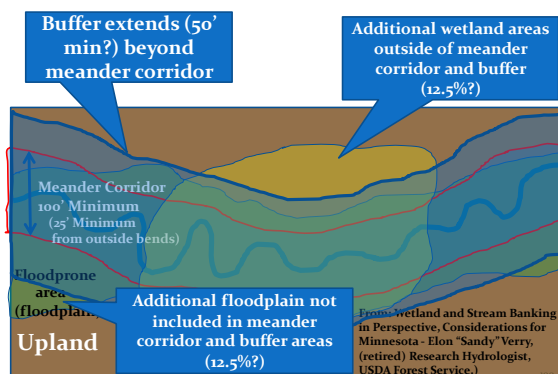
Stream Credit Example

| Area | Activity | Credit |
|-----------------------------------|--|--------|
| Meander Corridor (5 acres) | Remove dam, remove sediment, re-establish channel | 100% |
| Floodplain (10 acres) | Reconnect stream with its floodplain, re-establish some floodplain areas | 50% |
| Riparian Buffer (7 acres) | Establish native vegetation, long-term protection | 25% |

Stream Restoration Example



Additional Credit Areas?



Other Considerations for Restoration Actions for Streams

1. Need to be ***sustainable actions***, not temporary fixes.
 - No beaver dam removals, fish structures, etc.
2. Need to be focus on “***natural***” restoration actions.
 - No big rip rap or hard armor projects. Some may be necessary for certain projects, but if they are needed extensively, suggests that the sources of impairment have not been addressed/mitigated.

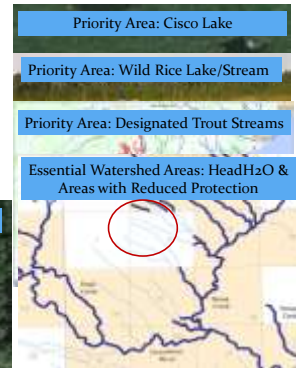
Prior Stakeholder Discussion

Preservation Actions

- Riparian Buffers
- Priority Resource Types
- Essential Watershed Areas

Preservation of Intact Riparian Buffer

Bank/Channel Stability
Floodplain Connection
Wildlife Habitat
Maintain Water Quality



Riparian Buffer Preservation

- Set minimum width but adapt buffer to specific site conditions.
- Must be sustainable.
- Crediting based on current process.
 - Probability of degradation
 - Functional Benefit for preservation
 - More for higher quality/higher priority
 - Consider Buffer Legislation (less credit?)

Buffer Example

Average width = 300 ft.



Prior Stakeholder Discussion

Watershed Implementation Projects

- Identified in a Plan
- Via ILF Program
- Complimentary Component
- Potential Projects

Watershed Approach

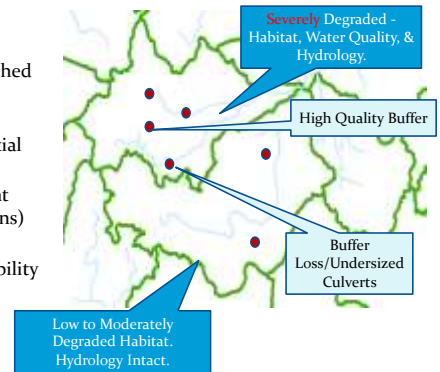
- Identify/Prioritize!



A Watershed Approach

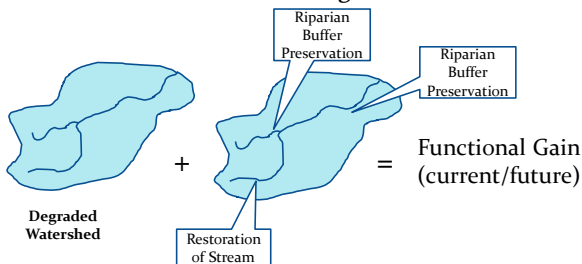
The Basics

- Identify watershed disturbance levels/types.
- Identify potential project sites.
- Site Assessment (functional gains)
- Prioritize sites based on the ability to restore, sustainability, current/future impacts, etc.



Result..

Identification of projects that will compensate or correct for the disturbance/stress types within the watershed for maximum ecological benefit!




Other Considerations

- Identification of watershed needs.
- Actively involves staff at all levels.
- Results in a Comprehensive potential project list.
- Use by private entities, partnerships, or ILF program.

Study Example

EPA Study Identified Potential Projects & Modeled opportunities at the Watershed Scale.



BSA 1

109

Report Approach

Inventory of site specific activities.

- Watershed plans, reports, & staff interviews.
- Assigned comparable wetland functional yield.

GIS based Landscape Level Modeling

- Used existing data sets.
- Resulted in an inventory & ranking of potential project opportunity at HUC 12 watershed scale.

Data sets were paired to produce final suitability maps by watershed.

Site Specific Inventory

Report Listed Numerous Potential Projects and Assigned a Comparable Wetland Functional Gain



| Alternative mitigation option | Project implementation action | Functional Gain |
|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. Wetland creation/ restoration | 1. Wetland creation/ restoration | 1. Wetland creation/ restoration |
| 2. Wetland creation/ restoration | 2. Wetland creation/ restoration | 2. Wetland creation/ restoration |
| 3. Wetland creation/ restoration | 3. Wetland creation/ restoration | 3. Wetland creation/ restoration |
| 4. Wetland creation/ restoration | 4. Wetland creation/ restoration | 4. Wetland creation/ restoration |
| 5. Wetland creation/ restoration | 5. Wetland creation/ restoration | 5. Wetland creation/ restoration |
| 6. Wetland creation/ restoration | 6. Wetland creation/ restoration | 6. Wetland creation/ restoration |
| 7. Wetland creation/ restoration | 7. Wetland creation/ restoration | 7. Wetland creation/ restoration |
| 8. Wetland creation/ restoration | 8. Wetland creation/ restoration | 8. Wetland creation/ restoration |
| 9. Wetland creation/ restoration | 9. Wetland creation/ restoration | 9. Wetland creation/ restoration |
| 10. Wetland creation/ restoration | 10. Wetland creation/ restoration | 10. Wetland creation/ restoration |

Site Specific Inventory

Restoration and/or protection of Riparian Corridors and Streams.

Miller Creek restoration to reconnect floodplain and reestablish stream plan/profile/rout/flow.

Functional Comparison:

Wetlands may provide storage for settling particulates. Stream bank restoration can reduce sediment loading. Both = water quality improvements downstream.



Potential Projects & Potential Functional Gains

Modeling for Identification of Opportunity

- Permanent Protection of land (preservation)
- Restoration of buffers, corridors and shoreline
- Stream Restoration
- Hydrologic Condition Improvement
- Peatland Hydrology Restoration

Ex. Potential Preservation Opportunity

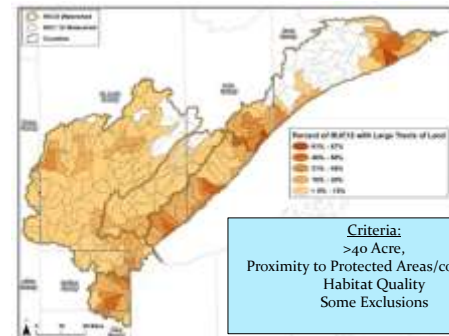
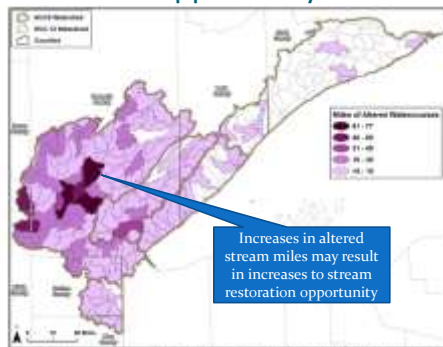


Figure 8. Watershed density – permanent protection of large tracts of land

Ex. Potential Stream Restoration Opportunity



Watershed Ranking System

Watersheds were ranked based on the “need” for preservation or restoration

Preservation Need= presence of high quality resources and potential for stressors.

- High Quality Resources = Trout Waters/Wild Rice/SNA etc.
- Stressor Surrogate Used= road density & mining proximity

Restoration Need= abundance or specific level of disturbance

- List of Impaired Waters (biota, turbidity, eutrophication)
- Altered watercourses

Watershed Preservation Rank

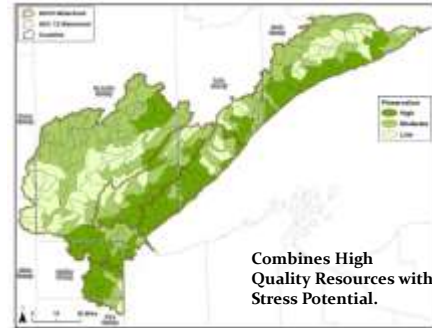


Figure 21. Watershed preservation ranking

Watershed Restoration Rank



Figure 22. Watershed restoration ranking

Next Stop....

Combine Analysis of Opportunity with Needs Analysis

Provides a Suitability Ranking for Alternative Action type by watershed.

Suitability of Preservation

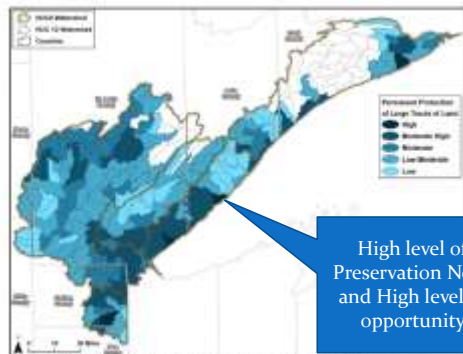


Figure 26. Watershed suitability – permanent protection of large tracts of land

Suitability for Stream Restoration

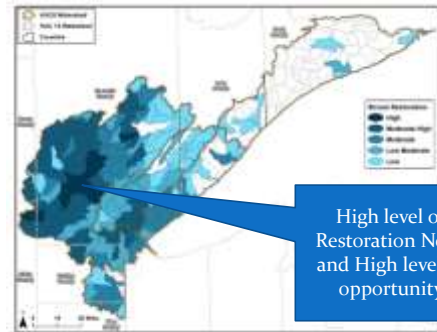


Figure 27. Watershed suitability – stream restoration and restoration of natural stream hydrology

Suitability for Dam Restoration

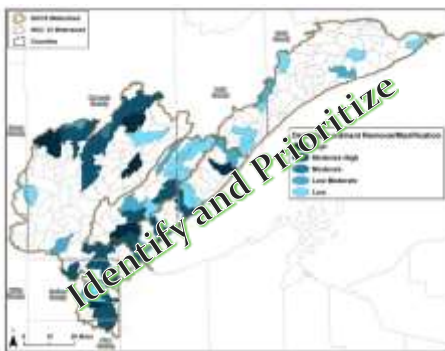


Figure 28. Watershed suitability – dam/restoration modification of reservoir

Broader Applicability

- Similar methods can be applied to other watersheds/BSA's.
- Identification of Potential Alternative Mitigation Projects throughout NE MN.

Broader Applicability

- Assists in prioritizing opportunity by watershed.
- Use by ILF Program
 - High Percentage of Public Lands
 - Good position for projects.



Questions and Feedback